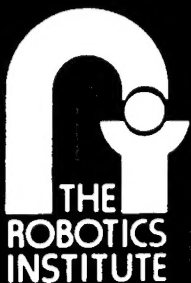


The Protection of Soft Property

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ABSTRACT

This article provides a treatment of intellectual property protection for all forms of intellectual, informational, and behavioral property.

The Protection of Soft Property

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Every once in a while it makes sense to stand back from current reality, from current concerns about practicality, and take a stab at a principled approach to a subject. The result is often a clearer vision of the way things ought to be. The present utopian view originated in a concern about the legal and technical protection of property in the third wave, the information age, and the age of computers. Being associated with computers for a long time, I have often been chagrined by the lack of basic competence in the legal community and a similar lack of basic competence in the community of companies pandering technology. This chagrin is probably only matched by their chagrin at my lack of basic competence in law and business. I nevertheless believe it might be useful to assert what I see as the way these lawyers and businessmen should be thinking. Again, a utopian leap of trust and faith is sometimes useful as providing something to think about.

A previous article [1] described the problem of deciding where technology ends and the law begins. Just as no technology can absolutely prevent a burglary and the law must intervene, no technology can guarantee the protection of intellectual property in cyberspace. In the information age, it is an interesting question to ask where technology ends and the law begins. When should law intervene to protect rights and enforce obligations in cyberspace? In a real sense, this article continues to explore this issue.

Definition of Soft Property

The whole spectrum of soft property includes all forms of intellectual property rights. Soft property is intellectual property, but it isn't called "intellectual" because it may not be intellectual. It may be the result of an honest day's labor by the average person, and it may be information that someone discovers, like he may discover gold nuggets in his back yard.

The laws of the 1700's and 1800's that condition our present day system of soft property laws simply did not recognize information as a commodity. Information could not be owned. Samuelson [2] has pointed out Thomas Jefferson's position that once an idea is spoken to another person, the idea is now public, and cannot be owned.

So consider that dictate across the spectrum of soft property: Patent laws clearly demarcate between concepts and algorithms that are unpatentable versus physical implementations that are. This classical distinction is currently being eroded, but it continues to hold today. Copyright and Trade Mark laws apply to books and to a tangible manifestation of the creative or barely creative act. They do not apply to the information, unless the compendium of information is somehow itself creative in its selection. But is this true? A counterfeit book in a different font with a different appearance is still a counterfeit. The words do count. Words are a pretty pure form of information.

Trade secret laws protect a person's or corporation's right to keep information secret, particularly if that information concerns information of commercial value such as the ingredients in Coca Cola. The effect of trade mark laws is that they give only a few years of protection, in the absence of use. Contract laws also respect secrets and allow that information can be consensually protected and owned by one party to the contract and not the other. Finally, freedom of speech laws permit the disclosure of information once the secret is out even if someone else may otherwise regard that information as his. He, even if he is the government, is not generally protected on the ownership of disclosed information except in cases where there is a national security concern.

In this case, we break Jefferson's edict, and hang the traitor if we think the information should not, somehow, have been made public. National secrecy laws, despite an obvious need for them, seem to fly directly in face of Jefferson's reasoning process.

The point of this cursory survey of intellectual property law is to illustrate the motley patchwork of the law, particularly as it regards information, or soft, property. Soft property can be defined as property that, once disclosed, loses its ownership, unless protected for finite time after the disclosure. Patents have 17 to 20 years, copyrights have 50 years, trade secrets can be protected as long as the secret can be held, and national security secrets last as long as the designated review boards deem the secrets worth keeping.

The legal protection of soft property always revolves around a kind of lease from Jefferson's evident edict that information, once divulged, is owned by the public. The property itself is leased, by right of creation or purchase, for a time, and then owned by everybody and, notably, anybody. Soft property, then, is property owned, sort of, for a time.

The Computer Revolution

Now, in the 1930's and 1940's a seemingly unrelated series of events of immense importance took place. The importance of these events was and, seemingly, continues to be, completely ignored by the legal and commercial machinery. To many of us in computing, the Turing's proof of his machine revolutionized the stuff of human interaction. Turing developed a proof of power for an abstract machine, that later, in the concrete form for the Von Neumann Machine, became the very concrete thing we know as a Computer. Turing proved this could mimic any physical process. It was possible to describe the behavior of any physically possible device as programmed behavior in a Turing machine.

If this is too abstract a concept, if it just sounds just too incredible to be credible, consider the tangible truth of it. Any car has at least a dozen computers in it performing functions that would be far more expensive to carry out mechanically. Computers are constantly making decisions for people, good decisions, as well as the stupid ones that people make jokes about. Computers are pervasive in every industry, in every way in which people physically interact with one another. They improve industrial processes and, often, replace physical processes. Where the mechanical processes simply pounded or pushed, computer controllers now reason or insure more sensitivity about where and how the mechanical parts that are left should pound and push.

Turing's Proof was as important, and certainly more pervasive in our everyday lives, than Einstein's proof of general relativity. So why don't we pay attention? To many computer scientists, this is a baffling question. Somehow people forget that the facts of life that drove Jefferson to his conclusions were violently altered by the incursion of computers.

Computer Limitations: The Constructs of Information Channel and Medium

The other important difference in our life is telecommunications. In Jefferson's day, it was possible to communicate information remotely and widely through print. For the sake of print, the 50 year copyright protection laws seem quite useful. But now information can be communicated through a dizzying array of means. Here again, there are proofs that have been, for all intents and purposes, ignored. The major one that concerns me, is the most general one, of information channel theory, Shannon's Theory and associated proof. What this work says is that the amount of information that can be communicated is always physically limited: It is limited by the channel capacity available.

A generalization of this notion, for which there is no theory or proof, but which seems to have a lot of face validity is the observation, from an otherwise fairly dense Marshall MacLuhan, that the "medium is the message." Somehow the medium of expression limits or otherwise shapes the message that can be communicated. Artists know this well. They know that oil and acrylic paints, though in principle capable of exactly the same expressions, nevertheless invite different expressions. In a Shannon sense, the amount of information available to a channel conditions or shapes what messages can be communicated through the channel.

Computers are no different since their input and output, and their internal computations, are channel limited and channel shaped. While we have to recognize that there can very reasonably be an "oil paint computer" and an "acrylic paint computer," we also have to recognize that something makes one "oil paint" and the other "acrylic paint." It may not simply be the software programming. It may be the programming, but it could also be the type of display, the type of artificial brush (light pen or pen) that has to be handled, and other kinds of physical computer input and output. Furthermore, a sufficiently creative person could invent the "X paint" computer, that creates an entirely novel kind of painting process -- one that has never before been seen or experienced, but which does exist in the world of Turing (or logical) possibility.

Soft Property as a Valuable Message for a Medium

In the utopian vision of the right way to protect information property, there is always a distinction between medium and message. The medium defines what it means to be a creative, or economically meaningful, message. That message then deserves the protection of a certain number of years. The number of years is dependent on the traditional competition between the needs of society to distribute the new message freely and the needs of the individual to justify his investment in the original invention. If the expression does not require effort, if it is not 'creative,' then the protection should be minor. I think that this usually is a matter of deciding the medium and the message. This utopian proposal requires that there be people skilled in the medium who can judge upon the tension between individual rights and societal rights.

Laws that ignore medium, or refer only abstractly to medium, make no sense. So, if we re-analyze Jefferson's description of common law, we say that speaking something is so easy that if someone else repeats it, it is not a counterfeit. However, we also have to ask if that something is, itself, a message in another medium. Deciding the medium is usually easy as long as it is recognized that the thing to be captured is the expression in the medium. So, for example, if our "oil paint" program will paint its paintings robotically under simple verbal control like, "Paint a beautiful picture of New Orleans," then the expression is as trivial as speech, and the outcome should not, no matter how beautiful and unique, be protected.

However, if the expression was the writing of the automatic "oil paint" program that permitted it to give its results, then the medium is clearly different. It is not the "oil paint" program, it is a computer and information environment in which the expression took place. We must decide whether to protect expression in that environment and for how long.

Samuelson argued that in the computer environment, behavior is a candidate for protection. But is this right? The behavior of a program, by Turing's Proof, can be anything that is logically possible. There are behaviors of some computers that are trivial because the expression is easy. Programming languages, such as objective programming languages, make certain graphical user interface devices such as windows obvious. This suggests that the idea of program behavior is too simplistic. Furthermore, the "oil paint" program may not need its behavior protected as much as certain static data structures from which its behavior partially derives. To say the tabular values, that may have been derived by yet another computer program of consequence, are "formula" and thereby not protectable is, to a scientist, like saying the words in a book are not protectable. Something is unfair. The balance is wrong.

Soft Property in a Domain of Commercial Application

If one assumes that one evaluates the message based on the medium, then what does one evaluate? What is the measure of protectability? The purpose of protection is to protect and thereby stimulate investment in more messages. This has to be considered a commercial purpose. Commercial purposes have domains of application. People protect the same property differently in different domains. There is, for example, widespread willingness to allow certain property to be used freely by academics but not other commercial vendors.

But more fundamentally, the fact that a computer, as a medium, applies, perforce, across all domains, suggests that there are at least some mediums where it is not enough to state the medium and the expression. One must also state the domain of application. In the case of a book copyright, we can state this as the right to reproduce the words in tangible form. But with recorders, books on tape, the right to reproduce by speaking is now also possible. Again, Jefferson is dated. Furthermore, if a reproduction is made in a computer, many, uncontrolled, reproductions will be made simply as a side effect of the computer's operation and maintenance.

Protection by Controlling Origination Rights

The analysis so far suggests that a copyright should not be aimed at controlling reproduction in tangible form, but at controlling origination. You cannot originate the book for someone else

without the Origination Owner's consent. The book is the medium and the domain of application is the domain of words, of textual matter. In that domain, it makes sense to protect the commercial rights of origination.

Protecting the commercial rights of origination may make sense for all soft property. Patents control the right to produce. I find nothing obviously wrong with equating the right to manufacture, the right to print, and the right to post on a computer bulletin board with the more general right to originate.

The Judge Must be Practiced in the Medium and Informed of the Domain

The book example is also good because it suggests a second well known problem. This is the problem of determining when a part of something has been copied. This problem is probably no harder in considering plagiarism of a book than in considering plagiarism of software. It does require that the judge know as much about expression in software as he would know about expression in books -- if he is to judge a property protection issue in software. In other words, factoring the message as a investment in a medium deserves protection for a domain of the message's application, and judging whether the protection has been violated requires practiced knowledge of expression in the medium and informed knowledge of the domain of the message's application. Without this, the investment cannot be properly judged, and therefore the protection that the law should afford.

Of course this means that judges that do not understand expression in software should not judge software property claims. Similarly, a judge that is not conversant in published CD Rom should not judge specialized CD Rom property. A judge has to know the medium to decide whether the message is valuable in it. Simply hearing "expert testimony" is not enough. While I regard this point as perfectly obvious, this puts an onus on the legal community that I, as someone not a part of it, feels perfectly willing to place.

The utopian generalization is that for all soft property, whether they be copyrights or patents, one must judge the value of the message in the medium and restrict the protection to the domain of application. The logic is that the computer, the discovery of the Turing Machine, forces us to do this.

As another concrete exercise of this utopian generalization, consider Eli Whitney's cotton gin. Whitney's medium was a mechanical contraption that was externally powered or made to move. Within the medium of mechanical contraptions, the expression was the cotton gin. The domain of application was separating seed from cotton. So, by the analysis so far, we should protect Whitney's right to originate his message, the cotton gin, properly in the domain of application, culling seeds from cotton. Now, since by Turing's proof I can now construct the cotton gin in software, we might ask the embarrassing question whether the software should now be protected by the patent (assuming for the sake of argument the patent is still fresh). The answer would be no, unless the domain of application, culling seeds from cotton, is the result of the software. A simulation is not a violation. But, if that simulation were linked to various devices that effected the culling, it would be a violation. I think this would agree with intuition. Furthermore, and I think this is particularly interesting, the simulation could be protected, if it is ingenious as an

expression in the medium of computers, independently of Whitney's patent. The right to originate the simulation could be granted to the person who wrote or bought the rights to originate simulation. The question is whether it is proper to do this.

So, now, consider the harder problem of whether software should be protected (outside the realm of contracts where virtually anything can be agreed upon). In the case of the person who wrote the cotton gin simulator, we need again to judge the domain of application. How might this person have regarded this as an investment? Perhaps this would be a great screen saver application for Microsoft Windows. Perhaps, it might be a teaching tool about cotton conditions. The question is whether the expression is sufficient in the medium, to warrant protection. In my view this, again, simply has to be judged by those practiced in the medium and informed about the domain of application. Then, it would seem, a right to origination could be protected even of this software, so that this person may make money or otherwise benefit from his labors.

Now we can ask about "an equation" or a particular "molecule." Can these things be protected? Traditionally the answer has been no, for various reasons, but basically an equation is a statement of fact and information cannot be protected once it is public. However, in the world of software, an equation may be a form of fact. This is a message in the medium of algebra and in the domain of software algorithms. The right of origination might then be protected in applying the equation in software while its use in deriving other equations may be deemed public use. But, similarly, an equation may represent creative expression for silicon design. Would the equation be protected in origination for silicon design? This is a question for judges practiced in algebra and informed about silicon design. If the algebra is obvious in the medium of algebra or the value of protection small as an incentive to further discovery, then protection should not be granted.

How Long to Protect Soft Property

Now there is the question of how long a time period should be granted for protection? This is not a question of how hard it was to achieve the effect in the medium, simply because computers and telecommunications have radically altered, if not destroyed utterly, the possibility of a single tangible form for information, creativity, or mechanical enterprise. This question has to arise in a question of how much to stimulate commercial interest in creating messages in the medium. So, for example, CD Roms as interactive multimedia players constitute a fairly clear new medium that invites unique expression. Should a CD Rom production be granted a 50 year copyright term, a 20 year patent term, or a 6 year trade mark term? Immediately we can say that granting a 50 year term would be a problem because CD Roms, at least as a unique medium, are not likely to be around that long. Or, perhaps, precisely because of this a 50 year term is desirable as an added incentive to invest. But, then, we may decide that production of CD Roms is not an activity that we regard as particularly worthy of promoting. After all, there are a lot of pornographic CD sales. We might want to say that any new medium is granted three years for origination protection on messages expressed in it, with extension possible.

This hardly resolves the issues surrounding the time periods for protection. In particular, there is a familiar period following the invention or introduction of a new medium where tools are developed. This is an experimental period. Tools for expression should possibly not be protected. A tool in the case of the CD Rom example might be a sound encoding method. This

concern is akin to the one that leads us to be concerned about protecting equations and formulae. But then, perhaps, tools should get the default three years of protection so as to stimulate interest in them but also not to inhibit their widespread use at a respectably early date.

We also need to ask about languages for expression, new mediums. Can these things be protected? The answer to this question is, fortunately, comparatively easy. A new medium is an authored or invented thing. New mediums can be owned in part or in whole. New mediums are built of the stuff of old mediums. This should be all that needs to be observed here.

In conclusion, we might note that it is unlikely that we will encounter a god-given new medium anytime soon. The presumption is that new mediums are man-made or man-discovered but it actually doesn't matter, since there are new man made mediums. We can begin our list with books, go to movies, radio, television, and then to personal computers. These are all invented, artificial, mediums. It is interesting that telephone is a distinct medium, whose components, as a medium, can be owned, but telephone messages have not presented property origination rights. It seems, perhaps, that Thomas Jefferson was right after all, that things that people say, their casual speech, is not regarded as owned, only attributable. But is this really true? It is illegal to copy a telephone conversation for public playing unless the parties consent. So, even the place where casual speech exists, there is consensus that this is soft property to be protected with origination restrictions, at least through the lives of participants. There is a question whether the Internet constitutes a new medium. Some people might even regard it as god-given since there was no intentional human master designing it. If it is a medium, then there are Internet works that deserve soft property protection.

If it is a commercial domain of application, and it might be this as well, then there are products for the internet that should be protected for use as tools for the Internet. However, the Internet, except in cases of internet tools, is not a domain of application.

Summary

To finish, the utopian view says that soft property is property that the government grants ownership for a period of time. It includes all property termed "intellectual" but could include "information property" and "software and hardware behavior property" as well. In the utopian view, there are three components of soft property that should be considered in considering the time of protection for soft property. Soft property is (1) a message expressed in (2) a particular medium for (3) a specific domain of application. The innovation value of the property has to be judged by jointly judging the innovation of the message in the medium and the specific domain of application. Restricted in this way, it seems reasonable to assign a yes-no decision for a fixed period of time. But only people conversant (experienced) in (at least, experiencing) the medium can judge the value of the message. In contrast, people informed (but not necessarily experienced) about the domain of application should be able to judge the value of the message with respect to that domain. The protection afforded soft property should always be protection to control origination as preferable to, in today's computer age, "copyright" or "right to manufacture and sell."

Utopian views are just that, utopian. But then, Jefferson's democracy was pretty utopian, too.

Aside from a complete overhaul of all intellectual property laws, the present view also suggests that judges overseeing claims in new mediums must be experienced in the new mediums as well as experienced in the law. But then, didn't lawyers read books? Wasn't there an implicit assumption in copyright law that the judge was a reader? I would suggest that the present utopian view be thought about as simply as summary of a common thread that exists already but rarely recognized explicitly.

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